Exhibit A

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

POWER INTEGRATIONS, INC., a Delaware corporation,

Plaintiff,

v.

FAIRCHILD SEMICONDUCTOR INTERNATIONAL, INC., a Delaware corporation, and FAIRCHILD SEMICONDUCTOR CORPORATION, a Delaware corporation,

Defendants.

C.A. No. 04-1371-JJF

REBUTTAL EXPERT REPORT OF ROBERT BLAUSCHILD

1. I, Robert Blauschild, am being offered as an expert to testify on behalf of Plaintiff Power Integrations, Inc. ("PI") in the above captioned matter. I have previously submitted a report regarding infringement of U.S. Patent Nos. 6,229,366 B1 (the '366 patent), 6,249,876 B1 (the '876 patent), and 6,107,851 (the '851 patent) by Defendants Fairchild Semiconductor Corporation and Fairchild Semiconductor International, Inc. ("Fairchild"). I submit this report in rebuttal to the report submitted by Dr. Paul Horowitz regarding PI's patents.

QUALIFICATIONS AND PROFESSIONAL EXPERIENCE

2. My qualifications and professional experience are set forth in my initial expert report.

I. INFORMATION CONSIDERED

3. In addition to the information cited in my initial expert report, I have reviewed and considered the information specifically cited in this report including the following:

a. Expert Report of Dr. Paul Horowitz.

b. Exhibits to Dr. Horowitz's Expert Report.

c. References cited in Dr. Horowitz's Expert Report.

4. For purposes of this report, I have assumed that all references cited by Dr. Horowitz are prior art. Nevertheless, I offer no opinion as to whether these references are prior art under the patent statutes.

5. I have formed the opinions set forth in this document based on my review of the information referenced above and on my experience. As I continue to work on this case, I may acquire additional information and/or supplemental insights that result in additional opinions. I note that Fairchild and Dr. Horowitz have modified in a number of respects the positions originally provided by Fairchild in its claim construction and non-infringement contentions. I have attempted to understand those differences and respond to what I understand to be Dr. Horowitz's and Fairchild's current arguments. I reserve the right to supplement my rebuttal report in light of continuing fact discovery, opinions from Fairchild's experts, and/or trial or deposition testimony. In addition, I reserve the right to provide rebuttal opinions and testimony in response to Fairchild's experts, and rebuttal testimony to Fairchild's fact witnesses.

6. I further reserve the right to use animations, enlargements of exhibits and/or demonstratives, and other devices to illustrate my rebuttal opinions.

II. SUMMARY OF REBUTTAL OPINIONS

7. I expect to testify that the asserted claims of the '366, '851 and '876 patents are not anticipated by the prior art relied upon by Dr. Horowitz in his report. Specifically, I intend to

testify that each of the prior art references cited by Dr. Horowitz is missing one or more of the limitations that are set forth in the asserted claims of the ’366, ’851 and ’876 patents. I also intend to testify that the asserted claims of the ’366, ’851 and ’876 patents would not have been obvious to one of ordinary skill in the art at the time of the invention. I further intend to testify that the asserted claims of the ’366, ’851 and ’876 patents would be understood by those skilled in the art and are adequately disclosed in the respective specifications of the patents.

III. 35 U.S.C. § 102 AND § 103 UNDERSTANDINGS

8. It is my understanding, under 35 U.S.C. § 102, that to anticipate a claim means that each individual reference must disclose every limitation of that claim of the patent, or the limitations must be inherent in the reference. In order for a limitation to be inherent in a reference, one of skill in the art would understand that the limitation must be present as a matter of technical necessity in the context of the reference, not that the limitation could or might be present, for example, as a choice of the designer.

9. I understand that a claim is invalid for obviousness under 35 U.S.C. § 103 if two or more references in combination disclose, either expressly or inherently, or render obvious each and every limitation of the claim, and one of ordinary skill would have been motivated to combine the two or more references in a manner that would embody or teach the claimed invention. I further understand that there must be a demonstrated motivation to combine the references to arrive at the claimed invention and such motivation can not be found from a hindsight examination of the art in view of the claimed invention. I also understand that a claim can be obvious in light of a single prior art reference, but there must be a teaching, suggestion or motivation to modify the reference to achieve the claimed invention. I further understand that

secondary considerations such as commercial success or long felt need, for example, should be considered if evidence of them is present and may provide objective indicia of non-obviousness.

IV. THE REFERENCES RELIED UPON BY DR. HOROWITZ

10. In his report, Dr. Horowitz relies upon a number of references to support his conclusions that the claims of Power Integrations' patents are anticipated or obvious. As detailed in my analyses of these references below, none of them alone anticipates or in any combination proposed by Dr. Horowitz renders obvious any of the asserted claims.

11. I have relied both on Dr. Horowitz's analysis and my own reading of the references because, as discussed below, in many instances, Dr. Horowitz merely makes conclusory statements, without identifying claim elements in his references or giving reasons why he believes elements would be inherent or obvious. I reserve the right to respond if and when Dr. Horowitz adds such information to his opinions.

12. With respect to the '366 and '851 patents, Dr. Horowitz appears to argue that anything that does any kind of soft start, or anything that varies frequency in any way—regardless of purpose, method, or context—anticipates and/or renders obvious PI's circuit patents. This sort of argument trivializes the art of circuit design and bypasses the actual inventions — the point of the inventions is an <u>integrated soft start circuit</u> that is regulation-loop-independent, and frequency variation that is cyclical <u>during normal operation for EMI reduction</u>, and none of the references discloses or teaches the claimed inventions (or the combination thereof found in some of dependent claims).

13. As pointed out below, circuitry for generalized soft start functionality and for varying switching frequency were disclosed in several references cited in the prosecution of the PI patents. The fact that the PI patents issued illustrates the differences ignored by Dr. Horowitz.

14. Some of the asserted dependent claims require a monolithic solution to soft start and/or frequency variation. To circuit designers and others in the semiconductor industry, "Monolithic" means made from a single crystal. This is consistent with the parties' currently agreed upon construction of "monolithic." All of the components are part of the single integrated circuit chip. *See*, *e.g.*, http:/www.websters-online-dictionary.com/definition/monolithic: "Pertains to the single silicon substrate in which an integrated circuit is constructed." Circuit designers strive to include as many of the components necessary for an application on the chip because that makes the product more attractive to a user (fewer extra components to buy and take up circuit board space). But sometimes components are intentionally left off of the chip because that adds flexibility to the product (e.g. the same chip could be used in different applications by choosing different external components). Sometimes components are left external because they are too difficult to integrate on the chip (e.g. large value capacitors that would greatly increase chip size and cost).

15. Dr. Horowitz takes the position that "monolithic" refers to circuits that are integrated but also include components that are not on the chip. [Horowitz Report at ¶¶ 72-73.] He appears to reason that because a chip is monolithic, and may require external components in an application, that the combination of the chip and the external components is "monolithic." It is not. Following Dr. Horowitz's reasoning, if additional internal components were moved outside the integrated part of his "monolithic" circuit, then the combination would still be "monolithic." There is no way to draw a line as to how much of a circuit has to be in the integrated portion of Dr. Horowitz's "monolithic" circuit for the circuit to remain monolithic. Dr. Horowitz's position renders the term "monolithic" meaningless.

16. Dr. Horowitz also takes the position that “the reduction of a useful circuit to a monolithic chip is not an ‘invention:’ it is the logical next step.” [Horowitz Report at ¶ 75.] This again trivializes the art of integrated circuit design. None of the integrated circuits cited by Dr. Horowitz or in the prosecution histories of the patents operates without any external components. Following Dr. Horowitz’s logic, none of the designers of those chips was interested in the “size, cost, system complexity, and reliability” advantages Dr. Horowitz cites as the reason for providing a monolithic solution. As discussed above, sometimes it’s preferred to NOT provide a monolithic solution, and in some cases it’s just not practical (unless someone comes up with an invention to make it practica1!).

17. At the hearing in this matter, I may describe each of the references relied upon by Dr. Horowitz. My trial testimony may also include animations, demonstratives, enlargements, and other devices to illustrate various aspects of the references cited by Dr. Horowitz.

V. CLAIM CONSTRUCTION

18. I will address claim construction issues below as they come up in the discussion of each reference, except for the terms “soft start circuit” and “frequency variation signal” which, because of their importance, I will address first here. Dr. Horowitz has applied these terms in a way very different than meant in the PI patents. This allows him to identify what he alleges is invalidating prior art that in many instances does not achieve the benefits of the inventions, is the same as art identified in the prosecution history of the patents, and is distinguished by the patents themselves as not being the inventions.

19. Soft start functionality existed before the ’851 and ’366 patents. The patents-in-suit, however, describe a particularly advantageous way of implementing the soft start function. The common specification for these patents describes prior art that uses an external capacitor for

soft start timing. ['366 patent at col. 2, line 65 – col. 3, line 17.] The patents state: *An object of an aspect of the present invention is directed to a pulse width modulated switch that has integrated soft start capabilities*. ['366 patent at col. 4, lines 27-29.] In addition, each of the disclosed embodiments of a soft start circuit use a frequency variation signal to provide soft start timing. [e.g. Figures 3, 6, and 9 and signal 400.] The patents state: The frequency variation signal 400 is provided to soft start circuit 410. ['366 patent at col. 6, lines 49-50.]

20. The soft start circuitry disclosed in the '366/'851 patents operates separately from the regulation loop, and can thus be used with different types of regulation without modification. For example, the same soft start circuit 410 can be used with voltage-mode regulation (as shown in Figures 3 and 6), or with current-mode regulation (not shown) or with fixed pulse width digital feedback regulation (as shown in Figure 9). The patents state: *Either current or voltage mode regulation may be utilized by the present invention without departing from the spirit and scope of the present invention so long as a signal indicative of the power supplied to the load is supplied to the feedback terminal 825 of the regulation circuit 850.* [e.g., '366 col. 11, lines 30 – 34.]

21. Dr. Horowitz, as detailed below, alleges that circuitry that includes an external soft start capacitor can be used to invalidate claims of the '366 and '851 patents. [Horowitz Report at ¶ 66.] This position is at odds with the prosecution history. For example, the SG1526 has a soft start capability that uses an external capacitor and would meet all of the requirements of at least '366 claim 1 according to Dr. Horowitz's understanding of the claim. The SG1526 is shown in an Electronic Design article cited as prior art on the face of the '366 patent. [<u>Power MOSFETs take the load off switching supply design.</u>] U.S. Patent No. 4,890,210, cited as a prior art reference in the '366 and '851 prosecutions, shows a Unitrode 2524A chip used with

external soft start components. This reference would also meet all the limitations of at least ’366 claim 1 according to Dr. Horowitz’s understanding of that claim. U.S. Patent No. 5,034,871, also a reference cited in the ’366 and ’851 prosecution histories, shows a PWM controller chip that uses external components (72 and 71 in Fig. 1) for implementing soft start functionality.

22. Besides rendering several of Dr. Horowitz’s references merely cumulative, these references cited in the prosecution of the ’366 and ’851 patents demonstrate that the Examiner did not consider the inventions to include soft start implemented with external circuit components. This is clearly demonstrated also by the fact that Figure 1 of the ’366 and ’851 patents, which uses external soft start capacitor 110, is labeled prior art and was distinguished by the inventors in the specification. [’366 patent at col. 2, line 65 – col. 3, line 17.] The Examiner explicitly recognized this as well. [’366 prosecution history, Notice of Allowability at 2 (“Fig. 1 should be designated by a legend such as –Prior Art—because only that which is old is illustrated.”)] Dr. Horowitz incorrectly claims that Figure 1 is invalidating prior art for ’366 Claim 1. [Horowitz Report at ¶ 69.]

23. Dr. Horowitz surmises that the Examiner allowed the claims over Figure 1 of the ’366 and ’851 patents because the figure allegedly does not show a maximum duty cycle signal. [Horowitz Report at ¶ 70 and ¶ 98.] Dr. Horowitz acknowledges, however, that the SMP211, which is shown and identified by part number in Figure 1, includes the maximum duty cycle signal as shown in its datasheet. Thus, according to Dr. Horowitz’s report, this claim element was missing when the Examiner looked at the application in the prosecution process, but present when Dr. Horowitz did his invalidity analysis. Presumably the Examiner knew of the SMP211 or would have looked at its datasheet.

24. The ’366 and ’851 Figure 1 circuit does not achieve the stated goal of these patents with respect to soft start functionality – integrated, independent, soft start capability.

25. I understand that Fairchild has taken the position that the soft start circuit should be construed to be “a circuit that minimizes inrush currents at start up.” This not only allows Dr. Horowitz to bypass the intent of the ’366 and ’851 patents with respect to soft start, but also sweeps in other soft start implementations clearly outside the scope of the ’366 and ’851 patents. For example, those of skill in the art knew that external filters or resistors could be used to limit inrush current. One example is shown in European Patent Application EP0748035A1, which includes an external resistor (R1 in Fig. 3) used to limit inrush current in a power conversion system. This reference was also cited in the prosecution of the ’366 and ’851 patents. Another reference cited in the ’366 and ’851 prosecution history, U.S. patent No. 5,041,946 (the “’946 patent”), shows a current source charging a capacitor to provide soft start functionality. [*See*, *e.g.*, ’946 patent items 31 and 32 in Fig. 2.]

26. The large number of different circuit arrangements that could be used for providing soft start functionality cited in the prosecution histories and known to those of skill in the art at the time of the ’366 and ’851 inventions leads me to conclude that the term “soft start circuit” should be construed to be limited to the corresponding soft start circuit structures disclosed in the ’366 and ’851 specification, and their equivalents. As discussed in my opening report, the disclosed structures are latch 450, comparator 460 with oscillator ramp and frequency variation signal inputs, AND gate 455, and OR gate 425 shown in Figures 3, 6, and 9. [See, for example, ‘851 col. 5, line 66 – col. 6, line 9; col. 6, line 25 – col. 7, line 8; col. 11, line 64 – col. 12, line 2.] The specification expressly excludes from the definition of “soft start circuit”

circuits using an external soft start capacitor. [*See, e.g.,* ’366 patent at col. 4, lines 46-47 and capacitor 110 in Fig. 1.]

27. I understand that the parties have a dispute with respect to the term “frequency variation signal.” Fairchild’s position that a frequency variation signal is a signal “used to modulate or change the frequency at which the switch is operated” bears no resemblance to what the frequency variation described and claimed in the ’366 and ’851 patents is about.

28. As described in my opening report and the ’366/’851 specification, switching regulators generate noise at the frequency at which they switch (Electromagnetic Interference or EMI). [e.g., ’366 col. 1, lines 30-48.] By providing and responding to a signal that varies switching frequency cyclically over time, emitted interference is spread out over a range of frequencies around a nominal frequency so that the interference is not concentrated at one particular frequency, but spread out at a lower level at frequencies within the range of variation. [e.g., ’366 patent at col. 3, lines 53-58; col. 6, lines 35-48; col. 9, lines 27-45.] The frequency variation described in the ’366 and ’851 patents is used to avoid a constant switching frequency during steady state operation of a switching voltage regulator. [’366 col. 8, line 56 – col. 9, line 45.]

29. By constructing “frequency variation signal” as any signal that modulates or changes the frequency at which the switch operates, Fairchild and Dr. Horowitz are able to render the frequency variation aspect of the ’366 and ’851 patents meaningless. For example, according to Fairchild’s proposed construction, an external resistor or capacitor that is used to set the magnitude of a fixed operating frequency could be considered a “frequency variation circuit” that generates a “frequency variation signal” because two users can operate at different switching frequencies. As detailed below, Dr. Horowitz identifies such a circuit as invalidating prior art.

[e.g., the Keller SMP260 article discussed below.] This is clearly incorrect. In such a scenario, each user operates with a single switching frequency, generates EMI at that frequency, and derives none of the benefit associated with the frequency variation described and claimed in the ’366 and ’851 patents.

30. According to Fairchild’s construction and Dr. Horowitz’s application of the term “frequency variation signal,” the Electronic Design article, cited in the ’366 and ’851 prosecution histories, would have all the elements of at least ’851 claim 1, including a “frequency variation circuit” and “frequency variation signal” according to Dr. Horowitz’s analysis (see, for example, Dr. Horowitz’s analyses of the TEA2260 and TEA2262 first embodiments and the Keller reference). The Electronic Design article cited in the prosecution of the ’366 and ’851 patents demonstrates that the Examiner did not consider the frequency variation aspect of the inventions to be merely providing the capability to operate at different frequencies with a different choice of components.

31. Other deficiencies in the Fairchild proposed construction of “frequency variation signal” will be detailed below with respect to Dr. Horowitz’s application of that term to certain of his alleged invalidating references.

32. I believe that one of skill in the art would understand the “frequency variation circuit” to be a circuit that provides the “frequency variation signal,” and that the “frequency variation signal” is an internal signal that cyclically varies in magnitude during a fixed period of time and is used to modulate the frequency of the oscillation signal within a predetermined frequency range. This is how the “frequency variation signal” is described in the ‘366/’851 specification. [e.g., ’366 patent at col. 6, lines 35 – 48; col. 7, lines 19 – 63; col. 7, line 54 – col. 8, line 37; and col. 8, lines 52 – 55.] The “cyclical” and “predetermined” nature of the frequency

variation signal are important because they allow EMI reduction and avoid the problem of line and load sensitivity discussed in the patents. [e.g., ‘851 col. 4, lines 36 – 38; col. 3, lines 31 – 37; col. 7, lines 45 – 49;col. 6, lines 10 -17.]

VI. REBUTTAL OPINIONS FOR THE ’366 PATENT

A. Conclusions Regarding the ’366 Patent

33. At the hearing in this matter, I expect to testify that claims 1, 2, 8, 9, 10, 14, 16, and 18 of the ’366 patent are not anticipated or rendered obvious by the references cited by Dr. Horowitz. At the hearing, I intend to point out that each of the references cited by Dr. Horowitz lacks limitations required by the asserted claims of the ’366 patent. I may also testify about the context of the ’366 invention and the technology preceding and following the ’366 invention including its differences from the claimed invention.

B. The Validity of the ’366 Patent

1. General Response to Dr. Horowitz’s Report re the ’366 Patent

34. Dr. Horowitz discusses the PI ’366 patent in paragraphs 60-93 of his report and makes several conclusory assertions that the ’366 patent is anticipated or rendered obvious in this section. Although I discuss in greater detail below the specific reasons I disagree with Dr. Horowitz’s conclusions regarding various references for which he has provided claim charts, I also note the following additional problems in the text of Dr. Horowitz’s Report.

35. In paragraph 66, Dr. Horowitz provides a large list of allegedly anticipatory references, but Dr. Horowitz’s assertion that these references anticipate the ’366 patent is conclusory. Dr. Horowitz has provided no reason, and certainly not clear and convincing evidence, that any of these references is in fact anticipatory. I disagree with Dr. Horowitz’s conclusory allegation in paragraph 66.

36. I also disagree with Dr. Horowitz's argument in paragraph 67 regarding the TEA2260. As discussed below, the TEA2260 relies on an external capacitor to implement soft start and is, therefore, like the distinguished prior art, not an equivalent structure to the soft start circuit of the claims.

37. I also disagree with the conclusion in Dr. Horowitz's report at paragraph 68. Dr. Horowitz makes a blanket statement that differences between soft start circuit box 410 in the patent's Figures 3, 6, and 9 circuits and prior-art circuits would have been obvious. This makes no sense to me without first pointing to any differences and then doing an analysis. The one theory that Dr. Horowitz proposes – *the prior art circuits already have a DMAX signal, thus ANDing it with another DMAX signal that grows with time would have suggested itself* – does not make sense to me. If a circuit already has a DMAX signal, why add another one? That would be non-obvious.

38. In paragraph 69, Dr. Horowitz suggests that '366/'851 Figure 1 has the soft start circuit of '366 claim 1. I disagree. As discussed below, the patent itself distinguishes the claimed soft start circuit from the soft start functionality of Figure 1.

2. Detailed Response to Dr. Horowitz's Claim Charts for the '366 Patent

a. SMP211 + Figure 1 of '366 patent

39. This combination is missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

40. While the patent states that the circuit of Figure 1 has soft start functionality, the patent also distinguishes it a being a prior art circuit that uses an external soft start capacitor. In addition, the patent distinguishes this prior art circuit as having problems with initial cycles. The patent describes the claimed soft start circuitry that solves the initial cycle problem. ['*366* col. 3, lines 2 – 17; col. 6, line 49 – col. 7, line 6.] An implementation of soft start using an external

capacitor is not the same as the structure corresponding to the claimed "soft start circuit" or its equivalent.

Claim 2 & 16

41. The asserted combination is missing the monolithic soft start circuit component of dependent claims 2 and 16. I disagree with Dr. Horowitz's position that it would be inherent or obvious to combine the soft start circuit he points to in a monolithic solution.

42. My understanding of "inherent" with respect to patent claims is that an element not shown must be there as a matter of necessity, not that it could be there as a matter of design choice. The fact that Figure 1 exists as it is shows that it is not necessary to do soft start functionality monolithically. "Inherency," as I understand it, is not removing an existing circuit for performing a function, and replacing it with a different circuit for performing that function (and in particular using a replacement that meets specific claim language). Such a substitution would merely be hindsight redesign based on the patent.

43. Dr. Horowitz does not identify what he believes to be the soft start circuit in Figure 1, but does opine that it includes capacitor 110. It would not be obvious to move external capacitor 110 into the SMP211 chip. First, as discussed above, a designer just can't take anything outside a chip and move it onto a chip. There is no value given for capacitor 110, and no basis to determine that it is even practical to integrate such a component. In addition, capacitor 110 is on the secondary side of the regulator, isolated from the SMP211. First, it would not make sense to move that component across the isolation barrier between the primary and secondary side of the regulator. And second, it is not obvious how such a move would provide any soft start capability, because the capacitor, as it is placed, works with secondary side

components to do soft start. Dr. Horowitz provides no description of how he would modify the combination.

44. If such a modification was obvious, why are there so many devices that use external soft start capacitors (both before and after the invention)? In addition, the Examiner had the disclosure showing Figure 1 with its external soft start capacitor in front of him and allowed the claims.

45. By stating that "it is inherent or obvious," Dr. Horowitz admits that the monolithic element described in Claims 2 and 16 is not shown. His opinion that it could be added is based on hindsight, and even so is incorrect as described above.

46. The combination is also missing the frequency variation circuit and signal of claim 14. Dr. Horowitz points to resistor 140 as being a frequency variation circuit that produces a frequency variation signal (current 135 through that resistor). This is not correct.

47. Current 135 is not an internal signal that cyclically varies in magnitude during a fixed period of time and is used to modulate the frequency of the oscillation signal within a predetermined frequency range. The patent does not call current 135 a frequency variation signal. In fact, the patent distinguishes this signal from the invention because it is NOT internal or predetermined. [e.g., col. 3, lines 40 – 46.] The patent states, describing the invention: *That is, the switching frequency of the pulse width modulated switch 262 varies according to an internal frequency variation signal. This has an advantage over the frequency jitter operation of Fig. 1 in that the frequency range of the presently preferred pulse width modulated switch 262 is known and fixed, and is not subject to the line voltage or load magnitude variations*. [col. 6, lines 20 – 26.]

b. UC1828/2828/3828; Unitrode App. Note U-128

48. The UC1828 is missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

49. These references teach conventional soft start whereby the control loop signal (feedback) is modified to limit duty cycle rather than using an independent soft start circuit as disclosed in the '366 patent. In addition, these references show an external soft start capacitor used to clamp the output of an error amplifier. This is precisely what is shown in the Electronic Design article cited in the '366 prosecution history and described above. The Examiner had the Electronic Design article in front of him and allowed the claims.

50. With respect to dependent claims 2 and 16, once again Dr. Horowitz opines that "it is inherent or obvious" to combine all of the regulation circuitry into a single monolithic device." I disagree for the reasons discussed above.

51. This reference in particular shows that it is not straightforward to move external components into a chip. The external soft start capacitor value is shown as 2.2nF. [FSC1686718.] Those of skill in the art know that a 100pF capacitor is large for an integrated circuit capacitor. A 2.2nF capacitor is 22 times larger and would take up so much area to integrate that the die size of the modified UC1823 product would be greatly enlarged, resulting in greatly increased cost. The '366 patent avoids this by having integrated soft start capability.

52. The UC1823 is also missing the monolithic switch and first terminal of claims 2 and 16. Integrating the switch and first terminal would require a redesign of the fabrication process by which the UC1823 is built, and a massively larger die size and cost. Such an undertaking would be impractical and non-obvious.

53. Because of the difficulties described above with respect to integration, this reference teaches away from the '366 claims.

54. This reference does not have the frequency variation circuit or frequency variation signal of claim 14. Dr. Horowitz does not claim that it is shown. Instead, Dr. Horowitz opines again that it would be inherent or obvious, without any support. The fact that this and numerous circuits have soft start functionality without frequency variation circuits (both before and after the invention) show that it is not inherent. The only motivation to add frequency variation circuitry, and additionally have it interact in a particular way with soft start circuitry, is hindsight to fill in a hole in Dr. Horowitz's claim chart.

c. TEA2260 + AN376

55. These references are missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

56. The TEA2260 uses an external soft start capacitor with specified range of 47nF to 1uF [FCS1687339], and cannot be the claimed soft start circuit as discussed above.

57. Dr. Horowitz's contention that the TEA2260 has a monolithic soft start circuit as required by claims 2 and 16 is not correct. These references clearly show the use of an external soft start capacitor. [e.g., FCS1687375.]

58. In addition, Dr. Horowitz does not identify the maximum duty cycle signal produced by an oscillator as required by claims 1, 2, 8, and 10. None is shown in these references. AN376 does show a maximum duty cycle signal, but it is generated by an auxiliary PWM circuit. [FCS1687356.]

59. The TEA2260 does not have the frequency variation circuit or frequency variation signal of claim 14. AN376 shows an external transistor used to switch operating frequency during power supply start up. Such operation is specifically distinguished in the '366 patent from the frequency variation described in the patent as discussed above. In normal operation, the TEA2260 operates with a fixed switching frequency, and generates EMI at that fixed frequency,

exhibiting the problem the ’366 patent addresses and solves. Even considering start up, frequency is never varied as described in the ’366 patent. There’s one fixed frequency during startup, and another fixed frequency during normal operation. This is nothing like the cycling of switching frequency to minimize EMI during normal operation as described in the ’366 patent.

d. Goodenough + SMP3

60. The Goodenough article describes a delay in turning on, not a soft start. And there is only a brief mention at that -- there is no discussion of how anything other than a delay in startup might be done. All the article says is that there is soft start with an internal capacitor connected to an intermediate stage of the error amplifier. It does not teach an enabling disclosure of the claimed soft start circuit. Just having a capacitor which provides a delay inside doesn’t limit inrush currents or prevent overshoot during startup.

61. At best, this reference teaches essentially the conventional soft start in which the feedback signal is clamped. But even that is not truly the case.

62. I disagree with Dr. Horowitz’s explanation of how the circuit on page 14 of the SMP3 schematic diagrams works. Dr. Horowitz states: *As the voltage on the node SFT_STR rises, the voltage on VOUT also rises*. This is not correct. As the voltage on the capacitor on the test pad ramps up, VOUT will remain clamped low and duty cycle will be minimum or zero. Nothing will happen until the capacitor charges to approximately 1.25V, after which time VOUT will be controlled by the input VIN-. This agrees with how the Goodenough article describes the circuit operation: *Until the capacitor is fully charged, the error amplifier output is clamped low, limiting the duty cycle and peak current of the switch during startup*. [FCS0528088.] Thus the circuitry pointed to by Dr. Horowitz is merely a delay circuit, and does not provide soft start functionality.

63. Internal soft start functionality (or soft start functionality of any kind) was not described or shown in the data sheet for SMP3, and the SMP3 schematic diagrams show that what is described in the article would not have worked to provide soft start. The claimed internal soft start simply wasn't in the SMP3.

64. The Goodenough and SMP3 references are missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

65. The article's disclosure is not sufficient to enable the function and the product itself did not have it. Dr. Horowitz ignores the lack of any soft start feature in the datasheet. The "analysis" of the SMP3 schematics is directly contrary to how the inventor explained the circuit when questioned about the schematics, and contrary to the description provided in the article itself. According to the inventor, the internal capacitor shown and the fact that the intermediate stage of the high-gain error amplifier only has one threshold show that the pieces Dr. Horowitz points to cannot perform a soft start function. Even if the SMP3 could perform a soft start function, or the disclosure of the article were enough to be enabling, the disclosure would be the same as the U-133 reference (see below), and would not be an equivalent structure because it would simply act to limit the error-amplifier output in the feedback loop as with "conventional" soft start.

66. These references do not have the frequency variation circuit or frequency variation signal of claim 14. Dr. Horowitz does not claim that they are shown in these references. Instead, Dr. Horowitz opines again that it would be inherent or obvious, without any support. This is pure hindsight to fit the claim limitation, and, as explained above with similar arguments, fails to come close to establishing obviousness of the claim.

e. Stasi + LM2577 + LM2588

67. These references are missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

68. The soft start implementation of these references is not the same as the corresponding structure or equivalent. These references use an external capacitor, different and not equivalent to disclosed structure (distinguished from the invention as described above). This is the same as the Electronic Design article and several other references discussed above, which were before the Examiner when he allowed the claims. These references also use a switching circuit in combination with an external compensation capacitor, and do not compare a frequency variation signal to an oscillator ramp signal.

69. Dr. Horowitz does not identify any maximum duty cycle signal provided by an oscillator, and the references don't show this element of claims 1, 2, 8, and 10. The output from the oscillator is referred to as a "reset pulse." This is inconsistent with the concept of a maximum duty cycle signal.

70. For claims 2 and 16, Dr. Horowitz relies on a statement that *The soft-start feature of our new regulator is unique in that it does not require any additional external components*. This does not state that there are no external components in the soft start circuit. The circuit uses an external compensation capacitor to provide soft start functionality. If that external capacitor were not used, there would be no soft start feature.

71. Dr. Horowitz claims that it is inherent or obvious that the LM2577 could be used in an AC mains flyback application as required by claims 8 and 18. I disagree. Dr. Horowitz relies on the circuit of Figure 15 of the LM2577 datasheet, which shows a flyback application. The absolute maximum allowed supply voltage and switch voltage for the LM2577 are 45V and 65V, respectively. [FCS0524994.] The LM2577 would be destroyed if it were used in an AC

mains application, for example, 85 – 265V as described in the patents. [‘366 col. 10, lines 9 – 14.]

72. These references do not have the frequency variation circuit or frequency variation signal required by claim 14. Dr. Horowitz does not identify any frequency variation circuit or signal. If Dr. Horowitz meant to identify the circuitry that changes the operating frequency during an output short circuit condition, then that would not be the claimed frequency variation circuit and signal. There is no EMI improvement, because the part is always operating at a fixed frequency. In addition, the change to a lower fixed frequency during an output short circuit condition is driven by the output load, not any internal frequency variation signal generated by a frequency variation circuit. The patent specifically distinguishes such a load dependent change from the invention. [’366 patent at col. 3, lines 40 – 46.]

73. If Dr. Horowitz meant to identify the externally applied on/off signal, then that would be incorrect also. Such a signal would not be generated by a frequency variation circuit (internal or external), and would not result in any EMI improvement.

74. The oscillator shown in these references operates at a fixed frequency during normal operation and at a lower fixed frequency if the feedback indicates a short circuit or the part is powered down. This can’t possibly do anything to solve the EMI problem, which is the purpose of the invention.

f. ’995 patent + AN-918 + LM3001/3101

75. These references are missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

76. The LM3001 and LM3101 and the ‘995 circuit all have external capacitors that operate to effect the feedback loop as with other conventional soft start features.

77. These references are no different in this regard than prior art (such as the Electronic Design article) that were before the Examiner when he allowed the claims.

78. Dr. Horowitz once again relies on his “inherent or obvious” argument for why claim 2 is invalid based on these references. These references describe circuits with large external capacitors. His reasoning is incorrect for the reasons described above.

79. The LM3001 does not have the frequency variation signal of claim 14 of the patent; it operates with a lower frequency only during an output short circuit. This is not the frequency variation circuit and signal of the ‘366 patent. See the discussion above with respect to the Stasi circuit. In addition, the LM3001 uses external resistors as part of it’s short circuit frequency shift circuit, unlike the internal frequency variation circuit disclosed in the ‘366 patent.

80. The LM3001 doesn’t have any frequency variation signal, and Dr. Horowitz doesn’t say that it does.

81. Although Dr. Horowitz lists the ’995 patent in the title of his claim chart, he does not refer to that patent in the body of his chart. The ’995 circuit has an external soft start capacitor and a short-circuit frequency shift circuit like the LM3101, and shares the same deficiencies with respect to the ’366 claims.

g. Keller Article + SMP240/260 datasheet (but no cites to datasheet in claim chart)

82. These references are missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

83. The structure in these references is not the same as the corresponding structure or equivalent because the reference teaches “conventional” soft start whereby a control loop signal (feedback) is modified to limit duty cycle rather than using an independent circuit. An internal digital current source acts in summing junction of feedback circuit to provide soft start

functionality. Dr. Horowitz does not identify any signal instructing the drive circuit to disable the drive signal during at least a portion of the on-state of the maximum duty cycle.

84. There is no maximum duty cycle signal shown provided by an oscillator as required by claims 1, 2, 8, and 10. Dr. Horowitz does not identify any, but instead just repeats the claim language, saying this reference has it. It doesn't.

85. With respect to claims 2 and 16, Dr. Horowitz claims that Figures 1 and 11 of the Keller paper show a monolithic oscillator. This is not correct. An external capacitor is shown in each of these figures (labeled C(in Figure 11).

86. With respect to claim 14, Dr. Horowitz relies on the fact that the SMP240/260 uses an external timing capacitor to set its fixed switching frequency to satisfy the frequency variation claim requirement. I disagree. Once a user picks a capacitor in an application, operating frequency is fixed. There is no frequency variation. This is no different than other fixed frequency references before the Examiner. Based on Dr. Horowitz's reasoning, any oscillator would include a frequency variation circuit and signal because the oscillator frequency could be changed by changing component values. This is a good example of why Fairchild's claim construction of frequency variation signal can't be correct.

87. Dr. Horowitz alternately proposes that it would be obvious to add a frequency variation circuit. This is pure hindsight to fit the claim limitation, in effect saying that it doesn't have this but it could. The fact that this and numerous circuits have soft start functionality without frequency variation circuits (both before and after the invention) shows that it would not be obvious that it should be added. The only motivation to add frequency variation circuitry, and additionally have it interact in a particular way with soft start circuitry, is hindsight to fill in a hole Dr. Horowitz's claim chart.

h. UCC3800 series & Unitrode App. Note U-133

88. These references are missing the soft start circuit of independent claims 1 and 9 and therefore dependent claims 2, 8, 10, 14, 16, and 18.

89. The soft start circuitry of these references is not the same as the corresponding structure or equivalent. The structure in these references is not the same as the corresponding structure or equivalent because the reference teaches “conventional” soft start whereby a control loop signal (feedback) is modified to limit duty cycle rather than using an independent circuit. These references do not compare a frequency variation signal to an oscillator ramp signal. An internal capacitor is used to clamp error amplifier output voltage. As discussed above, the soft start circuit of the patent operates in a different way. Because it is independent of the feedback loop, the patented soft start circuit can be used with any type of PWM control. The conventional soft start circuit, which clamps error voltage, cannot.

90. With respect to claims 2 and 16, Dr. Horowitz relies on Figure 27 and describes the switch as being monolithic. Figure 27 of the U-133 Application Note shows external oscillator components, so this reference is not monolithic.

91. With respect to claim 14, these references do not have a frequency variation circuit or signal, and Dr. Horowitz does not contend that they do.

VII. REBUTTAL OPINIONS FOR THE ’851 PATENT

A. Conclusions Regarding the ’851 Patent

92. At the hearing in this matter, I expect to testify that claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17 of the ’851 patent are not anticipated or rendered obvious by the references cited by Dr. Horowitz. At the hearing, I intend to point out that each of the references cited by Dr. Horowitz lacks limitations required by the asserted claims of the ’851 patent. I may also testify

about the context of the ’851 invention and the technology preceding and following the ’851 invention including its differences from the claimed invention.

B. The Validity of the ’851 Patent

1. General Response to Dr. Horowitz’s Report regarding the ’851 Patent

93. In general, as discussed below, Dr. Horowitz relies on references that describe fixed frequency operation, the very operation that the ’851 patent is designed to avoid. These references do not vary frequency over a range as claimed, or achieve the benefit of EMI reduction, thus providing further evidence that Fairchild’s construction of “frequency variation signal” can’t be correct.

94. In addition, Dr. Horowitz relies on references that have external signals used to alter operating frequency. The ’851 patent clearly distinguishes such signals from the invention. Dr. Horowitz identifies an external signal in the ’851 Figure 1 circuit as the claimed frequency variation signal. The patent says otherwise: *Alternatively, or in addition to soft start functionality, pulse width modulated switch 262 may also have frequency jitter functionality. That is, the switching frequency of the pulse width modulated switch 262 varies according to an <u>internal frequency variation signal</u>. This has an advantage over the frequency jitter operation of FIG. 1 in that the frequency range of the presently preferred pulse width modulated switch 262 is known and fixed, and is not subject to the line voltage or load magnitude variations*. [col. 6, lines 10 – 17, emphasis added.] and *Alternatively, or in addition to soft start functionality, pulse width modulated switch 262 may also have frequency jitter functionality. That is, the switching frequency of the pulse width modulated switch 262 varies according to an <u>internal frequency variation signal</u>. This has an advantage over the frequency jitter operation of FIG. 1 in that the frequency range of the presently preferred pulse width modulated switch 262 is known and fixed, and is not subject to the line voltage or load magnitude variations*. [col. 11, lines 43 – 50,

emphasis added.] The patent also states: *Another object of an aspect of the present invention is directed toward a pulse width modulated switch that has integrated frequency variation capabilities*. [col. 4, lines 21 – 23, emphasis added.]

95. Dr. Horowitz again in paragraphs 98 and 106 suggests that that the Dmax oscillator output is the only difference between the ’851 patent claim 1 and Fig. 1 of the ’851 patent. As I noted above in the discussion of the ’366 patent, Dr. Horowitz is incorrect. The Examiner noticed that Figure 1 did not appear to disclose an oscillator for generating a maximum duty cycle signal and a signal with a frequency range dependent on a frequency variation signal as recited in claim 1. [Page 5 of the December 13, 1999 Office Action.] As such the Examiner recognized the frequency variation signal, the frequency variation circuit that generated it, and their effect on the oscillation frequency were not disclosed in the prior art of record, including Figure 1.

96. In paragraph 107, Dr. Horowitz again sets forth a definition of “monolithic” that includes external components. I disagree with his characterization as discussed above.

2. Detailed Response to Dr. Horowitz’s Claim Charts regarding the ’851 patent

a. ’851 Pat Fig 1 + SMP211

97. The Figure 1 circuit and the SMP211 are missing the frequency variation circuit and frequency variation signal of claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. They are also missing the oscillator with a frequency range that varies according to the frequency variation signal of these same claims. This is consistent with what the Examiner said when he allowed claims during the ‘851 prosecution. [Dec. 13, 1999 Office Action cited above.] Accordingly, Dr. Horowitz’s suggestion that the claims were only allowed because they do not teach a maximum duty cycle signal [101] is incorrect.

98. The "frequency variation signal" identified by Dr. Horowitz is not internal (and, as discussed above, specifically distinguished from the invention by the specification). The "frequency variation signal" identified by Dr. Horowitz is not predetermined. The specification also distinguishes this signal from the invention on this basis: *Alternatively, or in addition to soft start functionality, pulse width modulated switch 262 may also have frequency jitter functionality. That is, the switching frequency of the pulse width modulated switch 262 varies according to an internal frequency variation signal. This has an advantage over the frequency jitter operation of FIG. 1 in that the frequency range of the presently preferred pulse width modulated switch 262 is* <u>*known and fixed*</u>*, and is not subject to the line voltage or load magnitude variations*. [col. 6, lines 10 – 18, emphasis added.]

99. According to Dr. Horowitz, someone could build the Figure 1 circuit and infringe the patent, even though the patent itself describes the circuit as prior art and the Examiner expressly said it was prior art. ['366 prosecution history, Notice of Allowability at 2 ("Fig. 1 should be designated by a legend such as –Prior Art—because only that which is old is illustrated.")] This makes no sense to me.

100. Dr. Horowitz describes the voltage bias out of the SMP211 bias block as an alternate frequency variation signal. Such a signal would not be produced by the claimed frequency variation circuit and would not be the claimed frequency variation signal. It would be produced by external circuitry and would not be predetermined. It would suffer from the same deficiency described in the patent.

101. With respect to claims 2 and 16, Dr. Horowitz once again resorts to his inherent or obvious argument. Inherency is clearly incorrect. The Figure 1 circuit operates as it is, showing that there is no necessity to move resistor 140 into the chip. And to do so would not be

obvious. Just the opposite. The fabrication process for the SMP211 would have to be modified to accommodate a resistor that could withstand hundreds of volts, and then inclusion of such a resistor would require the addition of another package pin, thereby raising the cost of the product. Dr. Horowitz provides no reason why it would be obvious to move the resistor inside the chip.

102. Dr. Horowitz's claim that "it is inherent or obvious that the frequency variation signal could also be used as a soft start signal" as required by claims 4 and 13 is amazing. The figure 1 circuit does not connect its soft start operation (with external soft start capacitor 110 on the secondary side of the regulator) with resistor 140 on the primary side of the regulator, and thus inherency is clearly incorrect. And it would be obvious to avoid such interaction. These features are done separately, on separate sides of an isolation barrier, and there's no suggestion (other than from the '851 patent) to use a frequency variation signal as a soft start signal.

103. Dr. Horowitz provides no discussion of how his proposed redesign would be done. His opinion is pure hindsight to fill in holes in his claim chart.

104. In addition, for reasons discussed above, the Figure 1 circuit does not have the soft start circuit of this claim.

b. TEA2260 + AN376

105. These references are missing the frequency variation circuit and frequency variation signal of claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. They are also missing the oscillator with a frequency that varies over a frequency range according to the frequency variation signal of these same claims.

106. The "frequency variation signal" identified by Dr. Horowitz is not internal. Instead, it is at a pin of the integrated circuit.

107. The TEA2260 does not have the frequency variation circuit or frequency variation signal of claim 1. AN376 shows an external transistor used to switch operating frequency during power supply start up. Such operation is specifically distinguished in the ‘851 patent from the frequency variation described in the patent as discussed above. In normal operation, the TEA2260 operates with a fixed switching frequency, and generates EMI at that fixed frequency, exhibiting the problem the ’851 patent addresses and solves. Even considering start up, frequency is never varied as described in the ’851 patent. With the TEA2260, there is one fixed frequency during startup, and another fixed frequency during normal operation. This disclosure is nothing like the cycling of switching frequency to minimize EMI during normal operation as described in the ’851 patent. This TEA2260 circuit operates at ¼ frequency during startup and then it runs at full frequency, and it cannot possibly do anything to solve the EMI problem, the very purpose of the invention of the ’851 patent.

108. In addition, Dr. Horowitz does not identify the maximum duty cycle signal produced by an oscillator as required by claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. None is shown in these references. AN376 does show a maximum duty cycle signal, but it is generated by an auxiliary PWM circuit, not an oscillator [FCS1687356.]

109. With respect to claims 2 and 16, Dr. Horowitz again resorts to his “inherent or obvious” argument. Neither is correct. The “frequency variation circuit” identified by Dr. Horowitz does not need to be incorporated on the chip – it isn’t as described -- and therefore there is no inherency. It would not be obvious that the circuitry pointed to by Dr. Horowitz could be integrated on the chip, particularly the 27nF capacitor, which one of skill in the art would have known would be impractical to integrate as discussed above. Thus the reference teaches away from claims 2 and 16.

110. Dr. Horowitz opines that it would be obvious to incorporate his “frequency variation circuit” onto the TEA2260/61 chip because that is what is done in a subsequent device, the TEA2262. I disagree. Dr. Horowitz himself identifies <u>external</u> frequency variation circuitry in his analysis of the TEA2262 (see below). None of the TEA2260/61/62 parts have the claimed frequency variation circuit, and each has external components identified by Dr. Horowitz as being part of his “frequency variation circuit.”

111. With respect to claims 4 and 13, the TEA2260 uses an external soft start capacitor with specified range of 47nF to 1uF [FCS1687339.], and therefore doesn’t have the claimed soft start circuit as described above. Dr. Horowitz does not claim that the claimed soft start circuit is shown. Instead he resorts to his “inherent or obvious” argument, stating that the “frequency variation signal could also be used as a soft start signal.” Dr. Horowitz provides no discussion of how his proposed redesign would be done. His opinion is pure hindsight to fill in holes in his claim chart.

c. De Stasi article + LM2588

112. These references are missing the frequency variation circuit and frequency variation signal of claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17 of the ’851 patent. They are also missing the oscillator with a frequency that varies over a frequency range according to the frequency variation signal of these same claims.

113. Dr. Horowitz does not identify any maximum duty cycle signal provided by an oscillator, and the references don’t show this element of claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. The output from the oscillator is referred to as a “reset pulse.” This is inconsistent with the concept of a maximum duty cycle signal.

114. These references are missing the drive circuit of claims 1, 2, 4, 7, 9, and 10. The magnitude of the oscillation signal (which, as described above, is not the oscillation signal of

these claims) is not compared to a variable threshold. Dr. Horowitz does not identify any drive circuitry in these references, and merely recites the claim language for his analysis.

115. Dr. Horowitz does not identify any frequency variation circuit or signal. If Dr. Horowitz meant to identify the circuitry that changes the operating frequency during an output short circuit condition, then that would not be the claimed frequency variation circuit and signal. There is no EMI improvement, because the part is always operating at a fixed frequency. In addition, the change to a lower fixed frequency during an output short circuit condition is driven by the output load, not any internal frequency variation signal generated by a frequency variation circuit. The patent specifically distinguishes such a load dependent change from the invention. ['366 patent at col. 3, lines 40 – 46.]

116. If Dr. Horowitz meant to identify the externally applied on/off signal, then that would be incorrect also. Such a signal would not be generated by a frequency variation circuit (internal or external), and would not result in any EMI improvement.

117. The oscillator shown in these references operates at a fixed frequency during normal operation and at a lower fixed frequency if the feedback indicates a short circuit or the part is powered down. This can't possibly do anything to solve the EMI problem, which is the purpose of the invention.

118. With respect to claims 4 and 13, the soft start circuitry of these references is not the same as the corresponding structure or equivalent. These references use an external capacitor, different and not equivalent to disclosed structure (distinguished from the invention as described above). This is the same as the Electronic Design article and several other references discussed above, which were before the Examiner when he allowed the claims. These references

also use a switching circuit in combination with an external compensation capacitor, and do not compare a frequency variation signal to an oscillator ramp signal.

119. Dr. Horowitz claims that it is inherent or obvious that the Stasi circuit could be used in an AC mains flyback application as required by claims 9 and 17. This is not correct. The absolute maximum allowed switch voltage for the Stasi circuit is 70V. [FCS0524438.] The Stasi circuit would be destroyed if it were used in an AC mains application (85-265V).

d. ’995 patent + AN-918 + LM3001/3101

120. These references are missing the frequency variation circuit and frequency variation signal of claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. They are also missing the oscillator with a frequency that varies over a frequency range according to the frequency variation signal of these same claims.

121. The LM3001 does not have the claimed frequency variation signal; it operates with a lower frequency only during an output short circuit. This is not the frequency variation circuit and signal of the ‘851 patent. See the discussion above with respect to the Stasi circuit. In addition, the LM3001 uses external resistors as part of it’s short circuit frequency shift circuit, unlike the internal frequency variation circuit disclosed in the ‘366 patent.

122. The LM3001 doesn’t have any frequency variation signal, and Dr. Horowitz doesn’t say that it does.

123. The ‘995 circuit has a short-circuit frequency shift circuit like the LM3101, and shares the same deficiencies with respect to the ‘851 claims.

124. The circuitry Dr. Horowitz discusses with respect to frequency variation responds to <u>output load</u> variations, precisely what the patent says it’s <u>not</u> doing. These circuits reduce operating frequency as a function of the output to prevent runaway associated with a short circuit output. This is not cyclical frequency variation to reduce EMI in normal operation as claimed.

These circuits operate with a fixed frequency during normal operation and do not achieve the goal of EMI reduction achieved with the patented frequency variation circuit and signal. The ’995 patent states: *During normal operating conditions, e.g., when Vout is approximately 5 Volts, and the load current is within the normal operating range, the oscillator output Vosc has a constant frequency*. [’995 patent at col. 7, line 66 – col. 8, line 2.]

125. With respect to claims 2 and 16, Dr. Horowitz resorts to his “inherent or obvious” argument.” He is not correct. The oscillator in these references uses external components for programming of its frequency. Thus putting those components inside the chip can’t be inherent. Nor would it be obvious. Putting those components inside the chip would totally defeat the programmability set out by the reference.

126. These references are also missing the soft start circuit of claims 4 and 13. The LM3001 and LM3101 and the ‘995 circuit all have external capacitors that operate to effect the feedback loop as with other conventional soft start features. Dr. Horowitz does not identify a signal that instructs the drive circuit to discontinue the drive signal according to a magnitude of a frequency variation signal as required by claims 4 and 13. Nor does he identify any frequency variation signal. Dr. Horowitz merely recites the claim language linking soft start and frequency variation and opines that it’s in these references. It isn’t. I reserve the right to respond when or if Dr. Horowitz identifies any of what he claims is in these references.

e. TEA2262

127. The TEA2262 is missing the frequency variation circuit and frequency variation signal of claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. It is also missing the oscillator with a frequency that varies over a frequency range according to the frequency variation signal of these same claims. The circuitry Dr. Horowitz refers to only affects the frequency when it passes a threshold. The TEA2262 has a fixed frequency oscillator. See, for example, the TEA2262

datasheet which states: *For this the TEA2262 contains all the functions required for primary mode regulation: a fixed frequency oscillator, a voltage reference, an error amplifier, and a pulse width modulator (PWM).* [FCS1686652.]

128. Dr. Horowitz does not identify any frequency variation signal. If he meant to identify the signal on pin 9 of the TEA2262, then that would be incorrect. Such a signal is external and not cyclical and isn't used to modulate the frequency of an oscillation signal within a predetermined frequency range.

129. Because the TEA2262 oscillator has a fixed frequency during normal operation, not a range, there is no EMI benefit. The oscillator operates at 1/4 frequency until the voltage on the soft-start capacitor is enough to exceed a threshold (2.5V) and then it runs at full frequency. The TEA2262 doesn't do anything to solve the EMI problem, which is the purpose of the invention.

130. With respect to claim 2, Dr. Horowitz points out that the TEA2262 has a monolithic switch. He neglects the TEA2262 oscillator and "frequency variation circuit" elements that are not monolithic. He also neglects these missing claim elements in his claim 16 analysis. It would not be obvious (or practical) to include these element on the chip, particularly the large capacitors.

131. With respect to claims 4 and 13, not only is the claimed frequency variation signal missing as described above, but there is no teaching that a soft start circuit provides a signal instructing a drive circuit to discontinue a drive signal when a magnitude of the oscillation signal is greater than the magnitude of the frequency variation signal. Dr. Horowitz implies that the "frequency variation signal" is the signal at pin 9 of the TEA2262 to the oscillator (FCS1686648), but he's wrong, as nothing shows that. Even if he was correct (he is not, as

described above), there's nothing to suggest that that signal is the same signal as the one that comes out of the top of the soft-start block that is compared to the ramp, as would be required to meet claims 4 and 13.

f. Toko TK75001

132. The TK75001 is missing the frequency variation circuit and frequency variation signal of claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. Dr. Horowitz does not identify any frequency variation circuit or signal in the TK75001, which is also missing the oscillator with a frequency that varies over a frequency range according to the frequency variation signal of these same claims. The TK75001 frequency variation described occurs during over-current conditions. As admitted by Dr. Horowitz, the TK75001 *includes a "frequency-reduction" function that is activated during overload conditions, and that reduces the operating frequency by approximately a factor of 2*. [55.] The TK75001 doesn't do anything to solve the EMI problem, which is the purpose of the invention.

133. Dr. Horowitz does not identify any maximum duty cycle signal provided by an oscillator in the TK75001 as required by claims 1, 2, 4, 7, 9, 10, 11, 13, 16, and 17. He does not describe or point out any ramp from the oscillator being compared to a variable threshold as required by these same claims. I reserve the right to respond when or if Dr. Horowitz identifies any of these claim components in the TK75001.

134. With respect to claims 2 and 16, moving the oscillator capacitor onto the chip is not inherent – the TK75001 operates without that capacitor being on the chip. It would also not be obvious to move the capacitor onto the chip, thereby eliminating the programmability feature described in the TK75001 datasheet. [See, for example, the Frequency vs. CT graph at FCS000217.] The programmability feature shows that this reference teaches away from claims 2 and 16.

135. There is no soft start circuit in the TK75001 as required by claims 4 and 13. Dr. Horowitz does not contend that one is shown. Instead he merely takes the position that it would have been obvious to add such a feature, and at that, to add it in the way claimed which relies on the frequency variation signal. It is not inherent to do soft start – the TK75001 doesn't do it. It would not be obvious. There is no suggestion to add soft start, and certainly no suggestion to add soft start in the specific way claimed on the '851 patent. Dr. Horowitz's position is nothing more than impermissible hindsight.

VIII. REBUTTAL OPINIONS FOR THE '876 PATENT

A. Conclusions Regarding the '876 Patent.

136. At the hearing in this matter, I expect to testify that claims 1, 17, 18, and 19 of the '876 patent are not anticipated or rendered obvious by the references cited by Dr. Horowitz. At the hearing, I intend to point out that each of the references cited by Dr. Horowitz lacks limitations required by the asserted claims of the '876 patent. I may also testify about the context of the '876 invention and the technology preceding and following the '876 invention including its differences from the claimed invention.

B. The Validity of the '876 Patent

137. Dr. Horowitz points to no prior art that teaches the simple and elegant solution for reducing EMI employing a counter coupled to a digital to analog converter which in turn drives the oscillator frequency control input. To the contrary, as discussed below, each of the references cited by Dr. Horowitz teaches away from such a solution.

138. The ‘876 patent describes a primary current or voltage that sets an oscillator frequency and secondary current or voltage sources that provide for frequency variation. None of Dr. Horowitz’s references show any of this.

1. Detailed Response to Dr. Horowitz’s Claim Charts for the ’876 Patent

a. Wang & Sanders

139. Dr. Horowitz’s first claim chart for the ’876 patent deals with an article by Wang and Sanders (“Wang”). Wang does not have the counter coupled to a digital to analog converter of claim 1. Instead, Wang places a ROM between his counter and digital to analog converter. Most of the Wang paper details why the ROM is necessary and how it should be designed, including pages of design equations regarding dependencies and how the digital to analog converter should be driven by the ROM to achieve the EMI reduction Wang seeks. The ROM purposely decouples the counter and the digital to analog converter, so that the counter output does not drive the digital to analog converter. Wang thus teaches away from the ‘876 invention.

140. Removing the ROM and coupling the counter to the digital to analog converter would render the Wang reference meaningless. Dr. Horowitz provides no opinion as to why one of skill in the art would throw out the fundamental teaching of Wang to arrive at the invention of claim 1.

141. Wang does not show any of the elements of claims 17, 18, and 19. Dr. Horowitz does not opine that it does. Instead, Dr. Horowitz opines that all of the elements of all of these claims are either inherent or obvious, without any explanation or support. I reserve the right to respond if or when Dr. Horowitz provides any actual technical opinion regarding these claims.

142. Wang shows a digital to analog converter. There are many types of digital to analog converters, and it would certainly not be inherent to operate his digital to analog converter in the specific way of claims 17 - 19. Even if one operated the Wang digital to analog converter

by cycling one or more secondary voltage sources, there is no reason to develop a primary voltage V and secondary voltage sources, each of which generates a voltage lower than V as required by claim 19. Dr. Horowitz's opinion is pure hindsight to fill holes in his claim chart.

143. Dr. Horowitz describes the "ramp slope" signal as the control input for the Wang oscillator. A ramp slope is typically set by currents charging a capacitor. It does not make sense to go away from that and say it would be obvious to do something different from what the Wang reference teaches in order to fit specific claim language.

b. Habetler & Divan

144. Dr. Horowitz's second claim chart for the '876 patent addresses an article by Habetler & Divan ("Habetler"). Habetler does not have the counter coupled to a digital to analog converter of claim 1. Instead, he places an EPROM between his counter and digital to analog converter. Most of the Habetler paper details why the EPROM is necessary and how it should be designed, including pages of design equations regarding dependencies and how the digital to analog converter should be driven by the EPROM to achieve the acoustic noise reduction Habetler seeks. The EPROM purposely decouples the counter and the digital to analog converter, so that the counter output does not drive the digital to analog converter. Habetler thus teaches away from the '876 invention.

145. Habetler teaches random modulation of switching frequency. To the contrary, the '876 patent teaches a simple counter and digital to analog converter approach. This is another reason why Habetler teaches away from the '876 patent.

146. Removing the EPROM and coupling the counter to the digital to analog converter would render the Habetler reference meaningless. Dr. Horowitz provides no opinion as to why one of skill in the art would throw out the fundamental teaching of Habetler to arrive at the invention of claim 1.

147. The Habetler paper does not disclose the primary voltage and secondary voltage sources of claims 17 – 19. Dr. Horowitz simply states that these elements are there without identifying them in any, except for what he calls the primary voltage. Even that sole identification is incorrect. Dr. Horowitz opines that the primary voltage in Habetler is labeled "primary slope" in Figure 5. There is no such signal or label in the figure. The "average slope" signal is not the claimed primary voltage (as Dr. Horowitz opines at [144]). There are no voltage sources shown in the figure. Habetler Figure 5 is simply a block diagram, and Dr. Horowitz appears to base his opinions regarding these claims on making up his own circuit to fit the claims, one that is not shown in Habetler.

c. Martin '417 patent

148. Dr. Horowitz's final claim chart for the '876 patent relies on U.S. Patent No. 4,638,417 ("Martin" or "the '417 patent"). Martin does not have the counter coupled to a digital to analog converter of claim 1. Instead, he places an EPROM between his counter and digital to analog converter. The whole point of the Martin patent is to use the EPROM to vary frequency in a pseudo-random manner to avoid generating a known frequency "signature" in military applications. [e.g., Martin at col. 1, lines 25 – 58 and col. 3, lines 1 – 20.] The EPROM purposely decouples the counter and the digital to analog converter, so that the counter output does not drive the digital to analog converter in the simple known and fixed way described in the '876 patent. Martin thus teaches away from the '876 invention.

149. Removing the EPROM and coupling the counter to the digital to analog converter in Martin would defeat the whole purpose of the Martin circuit. Dr. Horowitz provides no opinion as to why one of skill in the art would throw out the fundamental teaching of Martin to arrive at the invention of claim 1.

150. The Martin patent does not disclose the primary voltage and secondary voltage sources of claims 17 – 19. Dr. Horowitz does not identify these elements in the Martin patent. Instead, he simply resorts to his "inherent or obvious" argument. I disagree as discussed above with respect to the Wang reference. The single figure in the Martin patent is simply a block diagram, and Dr. Horowitz appears to base his opinions regarding these claims on making up his own circuit to fit the claims, one that is not shown in Martin.

151. I reserve the right to respond if Dr. Horowitz provides any opinion as to why one of skill in the art would find the primary voltage, secondary voltage sources, and supplemental voltage of these claims in Martin.

2. Further Response to Dr. Horowitz's Report re the '876 Patent

152. Paragraphs 134 -144 of Dr. Horowitz's Report address the PI '876 patent. Unlike in Dr. Horowitz's claim charts, paragraphs 135 - 138 all say that the coupling of the counter and digital to analog converter is "via a ROM." As noted above, this is not coupling as taught in the '876 specification and claim 1 of the '876 patent.

153. In paragraph 139, unlike the assertions in his claim chart, Dr. Horowitz discusses Figure 4 of the Habetler reference. He asserts that it would have been obvious to substitute a digital implementation with a counter and a DAC for "analog dither waveforms" shown in art he does nothing more than mention. As noted below, he fails to provide any detail for his assertion or how the alleged substitution would be motivated. On this issue, it should be noted that the Examiner cited references to analog circuits, including Power Integrations' own analog implementation of frequency variation, in the form of the '851 patent, yet allowed the claims directed to the digital frequency jitter circuit, including allowing claim 1 without comment in the first office action.

154. Dr. Horowitz also lists a number of references that he says have combinations that render claim 1 obvious. [Horowitz Report at ¶ 139.] He does not say how pieces of these references would be combined, or why one would be motivated to do any particular combination, picking and choosing pieces to fit the claim 1 requirements. I reserve the right to respond if and when Dr. Horowitz provides more than his conclusory opinion on this point.

IX. RESPONSE TO MISCELLANEOUS REFERENCES IN THE HOROWITZ REPORT NOT IN HIS CLAIM CHARTS

a. TEA1504 [99, 106, 118]

155. I understand that the TEA1504 reference relied on by Dr. Horowitz, dated March 17, 1998, may not be prior art.

156. Dr. Horowitz provides a conclusory opinion that the TEA1504 has all the elements of ’851 claims 1, 2, and 9, without identifying any actual elements in this reference.

157. The TEA1504 operates with fixed switching frequency, completely antithetical to the frequency variation disclosed and claimed in the ‘851 patent. The TEA1504 operates with one fixed frequency over most of its load range, and a lower fixed frequency when its load is below one ninth maximum. [e.g., FCS0525324; FCS0525328.] There is no EMI reduction as taught in the ‘851 patent.

b. LM2597 [34, 66]

158. The LM2597 uses an external capacitor in a conventional soft start scheme and thus does not have the ’851 and ’366 soft start circuit as discussed above.

c. The UC3807 [29]

159. Dr. Horowitz relies on this reference (among others) as teaching “internal full cycle soft start,” [Horowitz Report at 29.], but he does not explain in any claim chart or the text of his report why this reference would invalidate the claims of PI’s patents. A reference does not

teach the claimed inventions merely because it shows an internal soft start circuit. As noted above, the claimed "soft start circuit" is a means-plus-function claim element, and it covers the corresponding structure disclosed in the specification (and equivalents). As discussed above, the disclosed soft start circuit structure is independent of the regulation loop, unlike the error amplifier clamp of the UC3807, and is therefore not equivalent.

160. The UC3807 does not have a frequency variation circuit or signal, and Dr. Horowitz does not claim that it does.

161. Therefore, The UC3807 does not invalidate the claims of the PI patents-in-suit.

d. Stumfall '796 patent [43, 139]

162. Dr. Horowitz provides no analysis that the Stumfall '796 patent renders the PI patents invalid. The Stumfall reference is far afield from the PI frequency jitter patents. The Stumfall reference describes phase-locked loop circuitry applied to dot matrix printers.

163. Stumfall has no digital to analog converter, and there is no teaching of the digital frequency jitter recited as in the asserted '876 claims). Dr. Horowitz says one might combine this with other references to practice the PI invention "with ample motivation to combine," but he does not explain the basis for any alleged motivation to combine, nor does he explain why one would ignore what the Stumfall '796 patent does to do something different instead.

e. Hardin '920 patent [42, 103, 139]

164. In paragraph 42 of his report, Dr. Horowitz says Hardin uses "a counter, ROM, and DAC to generate the analog modulating waveform that is applied to the VCO," but he fails to note that the output of the VCO is not coupled to the counter as claimed in the '876 patent. In addition, the counter is not coupled to the digital to analog converter. Instead, it is decoupled by a ROM.

165. In paragraph 103 of his report, Dr. Horowitz suggests that one of skill in the art would plug a "triangle-like waveform" from the Hardin patent disclosure into the Martin patent disclosure to for some reason. I can't understand what Dr. Horowitz is saying here, or why he is saying it. He gives no reason why anyone would be motivated to change the teaching of the Martin patent based on Hardin, or how such a combination would be accomplished.

f. Maxim MAX796, Motorola MC34023/5, CS51021/3 [36, 66]

166. These references use external soft start capacitors and are no better than the art that was before the Examiner when he allowed the '851 and '366 claims that required soft start circuitry as described above.

g. Horowitz & Robinson [52, 139]

167. Dr. Horowitz opines that the difference between the prior art (which he doesn't identify) and '876 claim 1 would have been obvious based in part on his own work. My understanding is that must be some suggestion to combine various references. Dr. Horowitz merely opines that invalidating combinations could be done if someone had "ample motivation to combine."

h. Hoekstra [50, 104]

168. In paragraph 104 of his report, Dr. Horowitz opines that combinations of various references would render '851 claim 1 obvious. He provides no opinion as to how such combinations would be done, and does not point to any motivation for doing any of the particular combinations that he has in mind but did not discuss. I reserve the right to respond when or if Dr. Horowitz states an opinion on any combination of these references that identifies any claim elements, and points to any motivation or suggestion of doing his combinations.

X. RESPONSE TO OTHER MISCELLANEOUS ASSERTIONS BY PARAGRAPH

169. [Horowitz Report at ¶ 20.] While Dr. Horowitz is correct that soft start functionality can be used to reduce inrush current, this is not the only reason for using a soft start feature. Soft start can be (and is) used to prevent overshoot of output voltage when a regulator is first turned on. This is discussed in the '366/'851 specification: *Further, when the pulse width modulated switch conducts for the maximum possible amount of time in each cycle of operation the voltage, current and power at the output of the power supply rise rapidly. Since the feedback circuit of the power supply often does not respond as fast as the operating frequency of the switch, the rapid rise of the voltage, current and power will often result in an overshoot of the maximum voltage in the regulation range which will cause damage to the device being supplied power by the power supply*. ['851 col. 2, lines 17 – 25.] And, for example, *Regulation circuit 850 also may have integrated soft start capabilities. When the device to which the power supply is coupled is switched on, a power up signal is generated within the internal circuitry of regulation circuit 850. A power up signal is used to trigger soft start circuitry that reduces the duty cycle of the switch that operates within the pulse width modulated switch 262 for a predetermined period of time, which is presently preferred to be ten (10) milliseconds. Once soft start operation is completed, regulation circuit 850 operates according to its regular duty cycle*. ['851 patent at col. 11, lines 31 – 41.]

170. [Horowitz Report at ¶ 61.] In his footnote 24, Dr. Horowitz opines that *From a purely engineering point of view, the PWM converter whose structure is shown in Fig. 1 performs a soft start function as described in the asserted claims of the '366 patent*. This is not correct. For example, Dr. Horowitz admits in his claim chart for the Figure 1 circuit that it doesn't have the monolithic soft start circuit of asserted claim 2. He also takes the position that

the Figure 1 circuit does not teach the maximum duty cycle signal associated with the soft start circuit of all the asserted claims. [Horowitz Report at ¶70.]

171. [Horowitz Report at ¶83.] Dr. Horowitz asserts that the language of claim 9 of the '366 patent is unclear. To the contrary, it is clear from the context of the patent (switching regulators) and the recitation in claim 9 of a switch that the cycle that claim 9 refers to is a switch cycle – that is, one cycle of the switch being first on for a period of time and then off for a period of time. Dependent claim 10 narrows claim 9 by requiring that the claim 9 circuit includes an oscillator that provides a maximum duty cycle signal. The cycles of claim could be provided by an oscillator, or they alternately, for example, could be provided by one-shot circuitry configured in a constant off time control circuit. Claim 9 is not indefinite.

172. [Horowitz Report at ¶ 90.] In paragraph 90 of his Report, Dr. Horowitz discusses claim 16 of the '366 patent and its dependencies on earlier claims. It appears as though claim 16 should refer to claim 10, rather than claim 9, and one of ordinary skill would understand this.

173. [Horowitz Report at ¶102.] I disagree with Dr. Horowitz regarding the disclosure of frequency variation signals in the '366/'851 patents. The only disclosed signal Dr. Horowitz identifies is the triangle signal in the Figure 3, 6, and 9 embodiments. The patents, however, disclose other frequency variation signals: *Although the presently preferred frequency variation signal 400 is a triangular waveform, alternate frequency variation signals such as ramp signals, counter output signals or other signals that vary in magnitude during a fixed period of time may be utilized as the frequency variation signal*. ['851 patent at col. 6, lines 34 – 38.] Dr. Horowitz therefore improperly seeks to limit the scope of frequency variation signal to a single analog signal in direct contradiction to the express teaching of the patent specification.

174. [Horowitz Report at ¶106.] Dr. Horowitz's claim that the TK75001 and TEA2262 references anticipate '851 claim 2 because they show the "monolithic" elements of '851 claim 2 is incorrect. As discussed above, the TK75001 uses an external oscillator capacitor. Thus the TK75001 can not anticipate '851 claim 2. Dr. Horowitz himself identifies <u>external</u> frequency variation circuitry in his analysis of the TEA2262 and merely opines that the switch in the TEA2262 is monolithic. See the TEA2262 discussion above. Thus the TEA2262 cannot anticipate '851 claim 2.

175. [Horowitz Report at ¶113.] '851 claim 7 would not have been confusing to one of skill in the art. The claim describes frequency modulation (FM), which is clearly a modulation scheme in which an oscillator's frequency is varied over (or within) a range. The range of frequency variation is set by the magnitude of the frequency variation signal. The claim does not equate the frequency variation of the oscillation signal to the change in frequency variation signal as Dr. Horowitz would read it. Instead, it merely requires that the oscillator's frequency deviation is set by the magnitude of the frequency variation signal. For example, if the frequency variation signal is small, the oscillator frequency will not vary much. If the frequency variation signal is large, then the oscillator frequency will vary much more.

176. [Horowitz Report at ¶125.] '851 claim 11 would have not been confusing to one of skill in the art. Some switching regulators, both before and after the invention, had the capability of disabling regulation (stopping the switch from switching) based on a feedback signal. For example, if the error amplifier output is lower than the minimum oscillator ramp signal level due to a particular level of feedback at the error amplifier input, then there will be no switching. For higher values of error amplifier output signals, there will be switching and regulation. Some switching regulators included a comparator to disable switching if the error

amplifier output voltage rose above a threshold, indicating that feedback voltage was above a threshold. ’851 claim 11 does not require both regulation and the disabling of regulation at the same time as Dr. Horowitz would read it. Instead, the claim requires the capability of disabling regulation by a signal on a feedback terminal.

177. [Horowitz Report at ¶¶ 140 – 143.] Dr. Horowitz opines that ’876 claims 17 – 19 are invalid because they are not enabled. I disagree. Dr. Horowitz appears to base his opinion in part on the fact that there is more discussion of current sources in the patent than there is of voltage sources. First, I disagree with Dr. Horowitz’s opinion that the discussion of voltage sources at col. 3, lines 10 – 14 makes no sense because “one cannot connect more than one voltage source to an input.” Dr. Horowitz takes a very narrow reading of that description in the patent. There is no reason why more than one voltage source could not be connected to an input. The voltage sources could be serially connected to the input, so that the input voltage would be the sum of the voltages provided by the individual voltage sources connected to the input.

178. In his attempt to invalidate these claims, Dr. Horowitz neglects other descriptions in the patent of circuitry related to claims 17 – 19:

> *Counter 140 has a plurality of outputs Q1-Q3 (not shown) which are not used. The remaining outputs Q4-Q7 are connected to a digital-to-analog (D-to-A) converter 150, which may be implemented as a series of frequency jittering voltage sources or current sources*. [’876 patent at col. 4, lines 62 – 66.]
>
> *In another aspect, a method for generating a switching frequency in a power conversion system includes generating a primary voltage; cycling one or more secondary voltage sources to generate a secondary voltage which varies over time; and supplying the primary and secondary voltages to a control input of a voltage-controlled oscillator for generating a switching frequency which is varied over time.*
>
> *Implementations of the invention include one or more of the following. Where the primary voltage is V, each of the secondary voltage sources may generate a supplemental voltage lower than V which may be passed to the voltage-controlled oscillator. The supplemental voltage may be binary-weighted.*

['876 patent at col. 2, lines 42 – 55.]

XI. CONCLUSION

179. In view of the above, it is my opinion that claims 1, 2, 8, 9, 10, 14, 16, and 18 of the '366 patent, claims 1,2, 4, 7, 9, 10, 11, 13, 16, and 17 of the '851 patent, and claims 1, 17, 18, and 19 of the '876 patent have not been shown to be invalid in view of any of the references or arguments presented in Dr. Horowitz's report.

180. My investigation is continuing. I understand that discovery in this case is still in progress and I reserve the right to offer opinions regarding such discovery. I may make additions, deletions or modifications in the future that would be reflected in my trial testimony. For trial, I may prepare diagrams, charts and demonstrations that illustrate the issues presented. I also reserve the right to provide rebuttal testimony at trial on matters not covered in this expert report.

Date: January 9, 2006

Robert Blauschild

Exhibit A

Resume of Robert Blauschild

I have worked extensively in the field of analog and mixed-signal circuit design. After presenting two technical papers at the 1978 International Solid-State Circuits Conference (ISSCC), I was chosen by the 1979 conference chairman to serve on the ISSCC Program Committee, and have been similarly chosen 15 times since then. I was twice a member of the European Solid-State Circuits Conference Program Committee. My work on these committees consisted of evaluating submitted papers for originality and import, and deciding on rejection or acceptance for presentation at the conferences.

After obtaining a BSEE degree from Columbia University in 1971 and an MSEE degree from U.C. Berkeley in 1973, I joined the Analog Research Department of Signetics. I became Manager of Analog Research in 1976, with a department charter to investigate the application of new process technologies to analog functions.

My status with Signetics became that of a consultant in 1981, which allowed me to work with other companies including Hughes, MicroLinear, Exar, Stanford Telecom, and many others. I rejoined Signetics as Manager of Advanced Development in 1990.

The charter of my department was to do advanced designs with existing IC processes, the first designs with new IC processes, and consult with other departments on the development of all projects with analog content. We were also responsible for working with the wafer fabrication groups in developing new IC processes and devices.

I have participated as a panelist at various industry conferences, and taught several short courses and seminars in the U.S., Europe, and Japan. My designs and lectures have spanned a wide range of technologies, including NMOS, CMOS, BiCMOS, and Bipolar processing.

I have worked on and consulted on designs of a wide range of analog and mixed-signal circuits, including data converters, amplifiers, voltage and current references and regulators, timing circuits, line drivers and receivers, display circuits, phase-locked loops, and modems.

I have fourteen US patents and have designed over two dozen products with cumulative sales above $250 Million.

Robert A. Blauschild Educational Background and Professional Activities

Educational Background

1967-71	Columbia University	(BSEE)
1971-73	UC, Berkeley	(MSEE)

Work Experience

2004 - present Consultant

2000 - 2004 Ikanos Corporation (Circuit Design for DSL Communications Chips)

1997 - 1999 Consultant

1973-1997 Signetics Corporation (Philips Semiconductors)

- 1973 Member of Analog, Research Department
- 1976 Manager of Analog Research
- 1981 Consultant / Manager of Analog Research Department
- 1990-1997 Manager of Advanced Development

1981-1989 Design Consultant (Signetics, Micro Linear, Exar, Hughes, SSI, et. al.)

Product Development

Primary Design Responsibility

NE520S High-frequency Amplifier
NE5211, NE5212 High-speed Fiberoptic Preamps
NE5224, NE5225 Fiberoptic Post-Amplifiers
NE5080, KE5081 FSK Modem Chip Set
NE5180, NE5181 Octal RS232/433 Line Receivers
NE5170 Octal RS232/433 Line Driver
NE568A 150MHz PLL
Several High-volume Automotive custom circuits for engine control, anti- lock braking, and display systems
L272 Dual Op amp

Design Contributions

NE5210 Fiberoptic Preamp
NE3842 SMPS Controller

NE7025 1GHz Low-voltage Frequency Synthesizer
CD8360 CDMA Baseband Chip for Cellular Phones
NE660 Low-voltage Dolby Processor
NE569 Video CRT Driver
NE5230 Op amp
High-Voltage Ballast Controller
Various Bandgap Voltage References for Large Digital Chips
EEPROM Voltage Reference and Programmer Supply
Multi-channel IR Signal Processor
Automotive Bus Transceiver

Supervision of Development

NE5206 High-frequency Power Amplifier
NE5222 Fiberoptic Preamplifier
NE5214, NE5217 Fiberoptic Post-amplifiers
NE5209 Wideband Variable-Gain Amplifier
Switched-Mode Ballast Controller

Circuit Design Consulting Areas

Amplifiers
Line Drivers and Receivers
Voltage References
Linear and Switching Voltage Regulators
Phase-Locked Loops
Codecs and Modems
Oscillators

Professional Activities

ISSCC Program Committee (16 times, Analog Sub-committee Chair in 1984)

ESSIRC (European Solid-State Circuits Conference) Program Committee

Guest Editor of the Journal of Solid-State Circuits (1980 and 1986)

ISSCC Panel Organizer and Participant (4 times)

Panelist at Wescon and Custom Integrated Circuit Conferences

6 ISSCC Presentations

7 Journal of Solid-State Circuits Papers

Short Courses Developed and Taught

High-speed Analog Design

High-frequency Phase-locked Loops

Signal Amplification and Gain Control in Disk Drives

High-frequency PLLs for Disk Drives

Practical Examples of PLLs for Transceiver

Parasitic Effects In High-Frequency ICs

Transistor-Level Design of an Off-Line SMPS Controller

Technical Publications

High-voltage Analog Performance with Low-voltage Digital Devices, Journal of Solid-State Circuits, Dec. 1978

A New NMOS Temperature-Stable Voltage Reference, Journal of Solid-State Circuits, Dec. 1978

An Open-loop Programmable Amplifier with Extended Frequency Range/Journal of Solid-State Circuits, Dec. 1981

A Four-Terminal Wide-band Monolithic Amplifier, Journal of Solid-State Circuits, Dec. 1981

A 14-bit PCM DAC, Journal of Solid-State Circuits, Dec. 1982

An 8-bit, 50nsec A/D, Digest of Technical Papers, 1983 International Solid-State Circuits Conference

Fleetest FSK Modem Chip-set Goes the Distance, Electronic Design, August 14, 1983

A Wide-band Low-noise Monolithic Transimpedance Amplifier, Journal of Solid-State Circuits, August 1986

A Wide-band Class-B Video Output Driver, Digest of Technical Papers, 1989 International Solid-State Circuits Conference

"Understanding Why Things Don't Work", Analog Circuit Design - Art, Science, and Personalities, Butterworth-Heinemann, 1991, pp. 123-126

An Integrated Time Reference Digest of Technical Papers, 1994 International Solid-State Circuits Conference

Exhibit B

Power Integrations, Inc. v. Fairchild Semiconductor International

Index of Documents reviewed by Bob Blauschild

Description of Document	Bates Range
U.S. Patent No. 6,107,851 and file history	None
U.S. Patent No. 6,249,876 and file history	None
U.S. Patent No. 6,229,366 and file history	None
Deposition transcripts of KO Jang with exhibits (9/7/05 and 9/8/05)	None
Deposition transcript of Jin Sub Han with exhibits (9/5/05)	None
Deposition transcript of H.S. Choi with exhibits (9/12/05)	None
Fairchild FSD210B, FSD200B datasheet rev. 1.0.0	FCS0563277-94
Fairchild FSD210, FSD200 datasheet rev. 1.0.1	FCS0625278-93
Fairchild FSD210, FSD200 datasheet rev. 1.0.4	None
Fairchild FSDL0165RN datasheet Rev. 1.0.6	None
Fairchild FSDH0265RN, FSDM0265RN datasheet Rev. 1.0.4	None
Fairchild FSDM0265RNB datasheet Rev. 1.0.2	None
Fairchild FSDL0365RNB, FSDM0365RNM datasheet Rev. 1.0.0	None
TopSwitch-FX – Top233	PIF68532 – 68551
TopSwitch-GX – Top249	PIF77019 – 77037
TinySwitch – TNY256	PIF78050 – 78061
TinySwitch II – TNY268	PIF72493 – 72512
DPA Switch – DPA423	PIF63424 – 63447

Description of Document	Bates Range
TOP232-234 – TOPSwitch-FX Family – Design Flexible, EcoSmart, Integrated Off-Line Switcher	None
TOP232 Schematic TOP233 Schematic	PIF19959 – 20110 PIF68532 – 68531
TOP242-249 TOPSwitch-GX Family Extended Power, Design Flexible, EcoSmart Integrated Off-Line Switcher	PIF37516 – 37563
TOP242-249 TOPSwitch-GX Family, Design Flexible, EcoSmart Integrated Off-Line Switcher	PIF23845 - 23882
TOP242-249 TOPSwitch-GX Family, Design Flexible, EcoSmart Integrated Off-Line Switcher (with excluded power range)	PIF17020 - 17069
TOP249 Schematic	PIF77019 – 77037
DPA423-425P or G DPA-Switch Addendum Highly Integrated DC-DC Converter ICs for Distributed Power Architectures	PIF 63910 – 63913
DPA423-425P and G DPA-Switch Addendum Highly Integrated DC-DC Converter ICs with 220V MOSFET and PWM Controller	PIF30264 – 30267
DPA423-426 – DPA Switch Family Highly Integrated DC-DC Converter ICs with Distributed Power Architectures	PIF30268 – 30303
DPA423-426 –DPA Switch Family Addendum Highly Integrated DC-DC Converter ICs with Distributed Power Architectures	PIF63759 – 63794
DPA423 Schematic	PIF63424 – 63427
TNY263-268 – TinySwitch-II Family – Enhanced, Energy Efficient, Low Power Off-Line Switcher	None
TNY268 Schematic	PIF72493 – 72512

Description of Document	Bates Range
LNK302/304-306 – LinkSwitch-TN Family – Lowest Component Count, Energy Efficient Off-Line Switcher IC	PIF37464 – 37479
LNK353/354 – LinkSwitch-HF Family – Enhanced, Energy Efficient, Low Power Off-Line Switcher IC	None
TNY256 – TinySwitch Plus – Energy Efficient, Low Power Off-Line Switcher	None
TNY256 Schematic	PIF78050 – 78061
PWR-SMP260 Preliminary Datasheet	PIF82421-82433
Off-line Power Integrated Circuit for International Rated 60-watt Power Supplies, Richard Keller	FCS0527807 – 527814
SGS Thomson Microelectronics, Switch Mode Power Supply Controller TEA2262	FCS0303071 – 0303079
Random Modulated Boost Converter with Improved Harmonic Spectrum, Franc Mihalic	FCS0527519 – 0527524
Reduction of Power Supply EMI Emission by Switching Frequency Modulation, Feng Lin and Dan Chen	FCS0524693 – 0524698
Unitrode Application Note, U-128 The UC3823A,B and UC3825A,B Enhanced Generation of PWM Controllers, Bill Andreycak	FCS0524551 – 0524559
U.S. Patent No. 4,190,882 System for Reducing the Effects of Power Supply Switching, Chevalier at al. 02/26/1980	None
Programmed Pulsewidth Modulated Waveforms for Electromagnetic Interference Mitigation in DC-DC Converters, Andrew Wang and Set Sanders	FCS0000516 – 0000525
U.S. Patent No. 4,638,417 Power Density Spectrum Controller, Martin, Jr. et al. 01/20/1987	None

Description of Document	Bates Range
Expert Report of Paul Horowitz on Invalidity of U.S. Patents No. 6,107,851, 6,229,366 and 6,249,876 with Claim Charts and References	None
U.S. Patent No. 4,890,210 Myers	None
U.S. Patent No. 4,937,728 Leonardi	None
U.S. Patent No. 5,012,401 Barlage	None
U.S. Patent No. 5,034,871 Okamoto et al.	None
U.S. Patent No. 5,041,956 Marinus	None
U.S. Patent No. 5,481,178 Wilcox et al.	None
European Patent Application EP 0 736 957 A1	None
European Patent Application EP 0 748 035 A1	None
B. Pelly et al., "Power MOSFET's take the load off switching supply design," *Electronic Design*, Feb. 1983, pp. 135-139	None
U.S. Patent No. 4,712,169 Albach	None
U.S. Patent No. 4,930,063 Henze et al.	None
U.S. Patent No. 5,459,392 Mandelcorn	None
U.S. Patent No. 6,107,851 Balakrishnan et al.	None
Ashok Bindra, "Power-Conversion Chip Cuts Energy Wastage In Off-Line Switchers," *Electronic Design*, pp. 46,48	None
Fairchild charts re claim construction	None

Exhibit B

EXHIBIT REDACTED IN ITS ENTIRETY